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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/751,454	01/06/2004	Yeon-Soo Kim	2689-11	2362

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EXAMINER

ZEMEL, IRINA SOPHIA

ART UNIT	PAPER NUMBER
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1711

DATE MAILED: 09/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/751,454

Applicant(s)

KIM ET AL.

Examiner

Irina S. Zemel

Art Unit

1711

[Handwritten signature]

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5-18-04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: a symbol "□" appears throughout the specification in connection to the processing temperature. This symbol is not a conventional designation of any known temperature scale. Moreover, several times throughout the specification, the "□" symbol overlaps with (or precedes) the actual numerical expression of the temperature.

The specification contains a drawing, i.e., a graphical illustration in the descriptive portion of the specification. Such illustration is not within the purview of 37 CFR 1.58(a). The illustration is objected to. If applicants wish to include this illustration in the specification, they should submit a formal drawing in accordance with provisions of 37 CFR 1.81.

The illustration and the corresponding text are objected to because the description of the figure is not clear and misleading. It is not understood what the figure, in fact, illustrates. It is well known that MI would change with temperature for any given polymer. Does the figure refer to a specific polymer and MI value at of a specific polymer at different temperatures? The specification discusses changes in MI of compositions containing some peroxide depending on either melting or processing temperatures of different polyesters. If that is what the figure illustrates, applicants should clearly describe what polymer(s) and what peroxides were used to collect the data illustrated in the figure.

Appropriate correction is required.

Example 1 is confusing. On page 10 in lines 1-11, the specification recites "First, 100 parts by weight of terephthalic acid (TPA) and 75 parts by weight of ethylene glycol (2G) are input to a reactor for esterification for six hours while heating the mixture from 320 to \square 230 during reaction to produce BHT (Bis- β -Hydroxyethylene Terephthalate). The slurry of 175 parts by weight mixed with 30 parts by weight of TPA, 70 parts by weight of isophthalic acid (IPA), 65 parts by weight of EG and 10 parts by weight of DEG is subsequently input for two hours. The slurry is additionally reacted for one and half hour while keeping the temperature of the mixture at 230 \square .

Then 175 parts by weight of produced BHT is transferred to a condensation polymerization reactor. When the transferring is completed, 0.02 weight of phosphoric...." In this recitation, it is not clear what is referred to as "175 parts is mixed", i.e., 175 parts of what compound(s). Further, it is not clear which compound(s) is "subsequently input" as recited on line 6. Also, it is not clear what is meant by "175 parts by weight of produced BHT is transferred to a condensation polymerization reactor" recited on lines 9-10. Is RHT is supposed to be the reaction product of BHT with all additional components added to it or pure BHT synthesized in the first step of the reaction? Clarification is required. Applicants should note that the specification contains several phrases expressed in non-idiomatic English throughout the specification. Revision of the specification is suggested.

Claims 1-8 are objected to because of the following informalities: The method claims are recited in non-conventional format. It is suggested that the

steps of the claimed method are re-written in more conventional "ing" form, i.e., "mixing", "subjecting", etc., to avoid possible confusion in defining steps.

Appropriate correction is suggested.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 6 the processing temperature is designated as "□". The symbol used for temperature is not a conventional designation of any known temperature scale. The same symbol appears throughout the specification without particularly specifying what temperature scale is being used or claimed.

Claim 2 recites "inputting selected one into the mixture or some reaction products of terephthalic acid (TPA) and ethylene glycol (EG), or the mixture or some reaction products of dimethylterephthalate (DMT) and ethylene glycol (EG) under polymerization process". It is not clear what exactly is "selected one", and it is not understood what the meaning and scope of the clauses "some reaction product" is.

Claim 3 recites "said input materials", which lacks antecedent basis. Claim 3 recites that input materials are produced by inputting PTA and EG or DMT and EG, however claim 4 claims 17-50 parts by weight of said input materials. These two claims are inconsistent with each other because, according

to the specification, PTA and EG or DMT and EG should constitute the majority and not the minority of the polyester. Thus, it is not clear what the recited clause "said input materials" refers to.

Claim 6 recites "resin is cross-linked so that the melt index (MI) of the cross-linked aromatic polyester resin is 3 to 7 g/min at a temperature ranging 80 to 180 °C." The connection of the MI and the temperature range is not understood. Normally, MI is measured at a specified (standardized) temperature, and not over a range of temperatures. Further, MI varies considerably depending on the temperature, and the claimed MI range/temperature range does not provide sufficient correlation between the ranges.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 5, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 2002-121312 to JSP (Hereinafter "JSP '312") or 35

U.S.C. 102(e) as being anticipated by US Patent 6,686,400 to Tokiwa et al (hereinafter "Tokiwa").

Both JSP '312 and Tokiwa disclose a method for producing a foamed product based on polyester resin. The disclosed method includes steps of mixing the polyester with an organic peroxide crosslinking agent and a foaming agents, crosslinking the polyester with the organic peroxide and extruding the crosslinked polyester in an extruder at a melt extrusion temperature corresponding to the claimed temperature to obtained foamed particles. See illustrative examples in both references. Among suitable polyesters, aromatic/aliphatic polyesters that include considerable amount of terephthalic (aromatic) acid are explicitly disclosed in both references. (See, for example, column 2, lines 37-49 of Tokiwa). The polyesters used in the examples have melting points from about 100 to about 120 C. The reference further explicitly teaches that various additives such as fillers or pigments may be added to the foaming polyester compositions, preferably as master batch mixture with the base polymer. See column 5, line 29-49 of Tokiwa. The invention as claimed in claims 1, 5 and 8, therefore, is fully anticipated by the disclosure of the cited references.

Claims 1-5 and 8 are rejected under 35 U.S.C. 102(a) as being anticipated by JP 2003-003002 to JSP (hereinafter "JSP '002").

JP '002 discloses disclose a method for producing a foamed product based on polyester resin. The disclosed method includes steps of mixing the polyester with an organic peroxide crosslinking agent and a foaming agents,

Art Unit: 1711

crosslinking the polyester with the organic peroxide and extruding the crosslinked polyester in an extruder at a melt extrusion temperature corresponding to the claimed temperature to obtain foamed particles. See illustrative examples. Among suitable polyesters, polyesters based on terephthalic (aromatic) and adipic acid are explicitly disclosed in the reference. See paragraph [006]. The reference further teaches ethylene glycol as a suitable diol compound in [0010]. The polyesters used in the examples have melting points from 90 to 150 C, see [0005]. JSP '002 further teaches that the amount of the aromatic units can be as high as 50 %. See [008]. The reference further explicitly teaches that various additives such as fillers or pigments may be added to the foaming polyester compositions, preferably as master batch mixture with the base polymer. See column 5, line 29-49 of Tokiwa. The invention as claimed in claims 1, -5 and 8, therefore, is fully anticipated by the disclosure of the cited references.

Claim Rejections - 35 USC § 102/103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 6 is rejected under 35 U.S.C. 102(a, b, or e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JSP '002, JSP' 312 or Tokiwa.

For the purposes of this rejection the claim language is interpreted as reciting specific MI range measured according to ASTM 1238 after the composition is melt processed at the claimed temperature.

The disclosure of each of the cited references is discussed above. While each of the references discuss degree of gelation of the crosslinked polyesters, the references do not explicitly disclose actual MI of the crosslinked polymers. In view of the similarity of the processing conditions (including temperatures and amounts of crosslinking agent) between the examples disclosed in the references and in the instant specification, in view of a very wide range of the gel fraction (10 to 90 %, see, for example, [0005] in JSP '002) and in view of the wide range of the claimed MI and the processing temperatures, it is reasonable believed that the compositions disclosed in the above-cited references exhibit the claimed MI. The burden is shifted to applicants to provide factual evidence to the contrary.

Claim Rejections - 35 USC § 103

Claims 2-4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over JSP '312 and Tokiwa in view of JSP '002 and applicants disclosure.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over JSP '002 in combination with applicants' disclosure.

The disclosures of all three references are discussed above. The Tokiwa reference, JSP '002 and JSP '213 reference, while disclose aromatic content as high as 65 %, do not disclose polymers based on over 70 % of aromatic units.

Art Unit: 1711

Further, Tokiwa and JSP do not explicitly disclose polymers based on polyethyleneterephthalate (PETF), and rather explicitly disclose polybutelenterephthalate. However, JSP discloses that the amounts of terephthalic acid in excess of the disclosed amount would lead to lower biodegradability of the resulting polymers. This disclosure provides explicit motivation to increase the amount of aromatic acid for applications where biodegradable polymers are not desirable. Further, it is well known in the art that polyesters based on ethyleneterephthalate exhibit some advantageous properties as compared to either polyesters based on buylenetherephthalate of polyesters based on aliphatic diacids, as evidences, for example from background section of the instant disclosure on pages 1 and 2. Therefore, either use of ethylene glycol as a diol or increasing the amount of terephthalic acid in the disclosed aromatic/aliphatic polyesters would have been clearly obvious for an ordinary artisan to obtain polyesters with desired properties characteristic to PETF. Thus, the invention as claimed would have been obvious for an ordinary artisan from the teachings of the above cited references.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irina S. Zemel whose telephone number is (571)272-0577. The examiner can normally be reached on Monday-Friday 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (571)272-1078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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